were in every case, I believe, rather dense in character, either by a light sky, long development, by light getting to the plate before development, or by the old age of the plate before being exposed, especially those packed with sheets of paper between the plates. The ink used was always Stephen's Blue-black or Draper's Dichroic, and was written usually, if not always, on the envelope before the plate was put in. Some words as to when the plate was measured, or other notes, are added from time to time.

In view of the large quantity of plates that are being used in modern astronomy and stored in envelopes for future use it seems desirable to call astronomers' (and others') attention to this small matter, and to use every precaution to prevent any deterioration of negatives. Damp and an undue amount of sunlight are the greatest enemies to the gelatine film of a negative, but certainly by neither of these causes have our plates suffered at Oxford.

May the cause of this marking, not by bleaching, but by staining, be due to a strong acid or chemical used in the manufacture of the ink, or perhaps that combining with the chloride of lime, from which very little modern paper seems free?

For ordinary negatives the best precaution would undoubtedly be to varnish them, but for negatives required for measurement it is not to be recommended, as there are not many who could frequently flow the varnish over the plate without getting a ridge or overlap of varnish, either of which would tend to distort the image of a star or réseau line.

Nearly twenty years ago (1884 or 1885), some time after I first used the gelatine dry plate instead of the wet collodion process, I well remember spoiling some ordinary negatives by merely packing them for a short time with pieces of printed paper between them, and I could have read most of the printing impressed upon them. I believe I still possess some of these plates. Things of this kind one does naturally by inexperience, especially with a new article—as the commercial dry plate then was—and I have not been entrapped to treat negatives in that way since; but what I have made the subject of this short note is, I believe, new, and one that also requires attention being paid to it.

London: 1902 *Dec.* 12.

Note on Binding together Réseaux and Plates.

By J. A. Hardcastle.

It seems probable that réseaux will have to be laid on to photographic plates constantly in the near future for two sufficient reasons: (1) A réseau much facilitates measuring a

plate ; (2) a very large number of plates, *e.g.* all those hitherto taken in America, have no réseau impressed on them before development. In view of this fact it cannot be superfluous to put on record a piece of recent experience in connection with binding réseaux on to negatives.

It is not an easy matter to bind a plate bearing a réseau to a negative with complete rigidity, and it is on this point that a word of caution seems necessary. No binding, however secure in appearance, should be subjected to strain. In the particular instance on which this note is based it was found that, whether from damp or from other cause, the grip by which the plate is held firm in the measuring machine caused one plate to slip over the other. It occurred in the course of Mr. Saunder's work in the measurement of lunar photographs (see *Monthly Notices*, vol. lx., p. 174, and vol. lxii., p. 41). The photographs we have been measuring were taken at Paris and have no réseau on them. The size of the Moon on these plates is about $6\frac{1}{2}$ inches, while the réseau was less than 6 inches square, consisting in fact of 31 lines in each direction 5 mm. apart. In the plate in question the phase was but little over half-moon, and so it was possible to cover the whole visible moon with the réseau by placing the terminator diagonally. The corners of the negative were trimmed off, but the plates were eventually bound together with the edge of one projecting slightly on one side and the edge of the other projecting slightly on the opposite side. The risk of displacement would, of course, have been considerably diminished had the same plate projected on all four sides, but it was desired to reproduce previous measurements and the advantages seemed to outweigh the risks. The binding was extremely strong, but it became evident eventually that a translation amounting to ·075 mm. (·003 in.) and a rotation of $52''$ had taken place.

Although the larger part of this shift was proved to have taken place on one particular day in September, during which the plate was not taken from the measuring machine, the remainder of the displacement (about ·03 mm.) occurred apparently more or less gradually in August.

The only possible method of detecting such a gradual displacement is the daily record of the positions of four fiducial marks, one at each corner of the negative. Such marks may be made on the film of the negative with a needle-point before binding, and should be read at the beginning and end of each day's work.

For the binding seccotine would be preferable to ordinary gum, and a touch of shellac might be used between the films at each corner.

Another difficulty in using réseaux bound on to negatives arises from the fact that the surfaces of the glass are not plane, and accordingly contact is not universal over the whole negative. Besides the obvious risk of parallactic displacement of a réseau-line relatively to the negative there has been further found a

change of position of réseau-lines when the direction of the source of illumination changes. It has accordingly been found necessary to use an adjustable clamp, to press the two surfaces into contact in the neighbourhood where measurements are being taken. The use of plate glass would obviate the necessity of this precaution; but the fact remains that it has not been used, nor have réseaux been impressed on the negatives, and it is accordingly a matter of great interest that experience in dealing with the plates actually in existence should be recorded.

Photographic and Visual Magnitudes of α Orionis.

By W. H. Robinson.

(*Communicated by A. A. Rambaut, M.A., Sc.D., F.R.S., Radcliffe Observer.*)

Since Mr. Packer's announcement concerning the increase of brightness of *α Orionis* several photographs of the region of the sky including this star have been secured, the half-plate camera used being that employed last year in the determination of the photographic magnitude of *Nova Persei*. The results of the latter investigation were published in the *Monthly Notices* of the R.A.S., vol. lxii., Nos. 3 and 6. In No. 3 the writer drew attention incidentally to the chemically active quality of the light of the new star on 1901 March 9, and contrasted with it the non-actinic character of the light of *α Orionis*, which at the time was visually similar to it in colour. This photograph has now become additionally useful, being included with the recent photographs in the following discussion.

In the present paper the methods of measurement of images and reduction of results for *α Orionis* are precisely similar to those adopted for *Nova Persei*.

Nine comparison stars have been selected in determining the scale of brightness. The names of these, with their tabular (Harvard) magnitudes and mean measured photographic brightness, are as follows :—

Name of Star. *Orionis.*	Tabular Magnitude.	Scaled Photographic Brightness (Means).	Name of Star. *Orionis.*	Tabular Magnitude.	Scaled Photographic Brightness (Means).
γ	1·75	20·0	λ	3·5	45·8
e	1·75	28·2	σ	3·75	53·2
ζ	1·9	28·4	A	4·4	56·6
δ	2·5	31·1	ϕ^1	4·4	58·8
η	3·45	50·3			

Plotting the above values on square-ruled paper, and drawing